

## PATENT SPECIFICATION

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William P. Newton et al.-  
Support System for  
Laterally Removable Sash

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## COMPLETE SPECIFICATION

### Improvements in and relating to Balancing Devices for Mutually Sliding Construction Parts

I, JOHANNES HERMANUS ADDICKS, of 4, Monnikenstraat, Amsterdam, the Netherlands, a subject of the Queen of the Netherlands, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The invention relates to devices for balancing a sash window or like part sliding in a window frame or like guide; and specifically to devices consisting of at least one helical spring extending in the direction of sliding between the relatively sliding parts, fixed at one end to one of them, and at the other end attached to a rotatable slotted part held by a tube at a distance from the first end of the helical spring so that it cannot move axially of the spring, and of a flat twisted strip passing through the slotted part and adapted to be attached at its projecting end to the other of the relatively sliding parts.

25 A device of this kind is known, in which, in addition to an outer spring stressed in tension, there is a spring, not loaded by tensile forces, supported and guided by a tube surrounding it, which is fixed at one end to one of the relatively sliding parts and carries at the other end a rotatably attached slotted part through which the twisted strip passes. When the slotted part is so attached it is after mounting inaccessible for examination and maintenance. Further the rotatable attachment of the slotted part to the tube, comprising an inturned rim on the tube engaged in a circumferential groove in the slotted part, is not suitable for mass production, as it is difficult to make such a connection sufficiently accurate; for if the slotted part is subjected to eccentric forces as the twisted strip slides through it, the rotatable attachment

can easily catch and wear takes place.

The invention now aims at obviating the above drawbacks in a simple manner.

According to the invention the slotted part is fixed to the tube, and the other end 50 of the tube is rotatably connected with the connecting nipple of the spring. Thus the rotatable connection of the slotted part is removed to the other end of the tube and remains easily accessible; for when the 55 window or like sliding part is slid down, the upper end of the balancing device is above the sliding part, if, as usual, the balancing device is mounted in a groove in the guide frame of the sliding part. Furthermore a good central thrust bearing can be made, which cannot catch, and even when the nozzle is eccentrically loaded the frictional resistance in the bearing remains practically unaltered and low. Also, the 65 construction according to the invention makes it possible, if necessary, to reduce the total diameter of the whole device further than is possible with known constructions. 70

The tube carrying the slotted part may with advantage pass internally through the helical spring, and be connected centrally in a rotatable manner with the connecting nipple of the spring at the other 75 end. Such a construction is easy to make, and the helical spring, which is not tensioned, is well guided as is especially desirable when it consists of a great number of turns of thin wire. 80

The tube may conveniently be connected to the nipple by a plug fixed to the tube end and supported in a central bore in the nipple by a stem passing through a central opening in the otherwise closed lower end 85 of the nipple, and carrying a collar. Thus the bearing at which the tube is supported is within a receptacle which can serve to hold a definite amount of grease or other lubricant. Preferably the collar is sub-90

stantially hemispherical and is supported in a hollow of co-operating shape in the nipple. In this manner a thrust bearing is obtained in which the friction is low and which, in addition, admits some play in a radial direction.

The invention will now be further elucidated with reference to an example of performance shown in the drawing, in which:

10 Fig. 1 shows a longitudinal section of a balancing device according to the invention with internally guided spring; and Fig. 2 a view of it from below.

In the drawing 1 indicates the balancing 15 spring which is shown as a helical spring of relatively thin wire. At the top end this spring is fixed in usual manner to a connecting nipple 2 in which are diametrically opposite holes 3, to receive a screw 20 by which the nipple, and may be a protecting sleeve 4, can be fixed to a part of the sliding structure to be balanced, for instance to the frame of a window. At its other end the helical spring 1 is fixed to 25 the extreme end 5 of a tube 6, which extends through the helix and guides it. At the top the tube is closed by a plug 7 fixed to it, and this plug has a stem 8 of less diameter passing through a central opening in the otherwise closed end of the hollow 30 nipple 2. The interior surface 9 of this end of the nipple is concave and, say, conical and in it rests a hemispherical collar 10 through which the stem 8 passes. The 35 collar has substantially line contact with the nipple. The tube 6 is thus supported in an easily rotatable manner. At a small distance above its bottom end the tube 6 is partly flattened, so as to form a slot 11, 40 through which passes a flat twisted strip 12 of relatively large pitch. The lower projecting end of the strip 12 is attached to one end of a transverse strip 13 in a fashion which prevents the twisted strip from 45 turning. The other end 14 of the strip 13 is turned upward and toothed, and is adapted to be fixed to the bottom of a window sash or like part by screws. The transverse strip takes the stress initially 50 imparted to the spring during mounting.

When the device shown is made for heavy windows or the like there may be a second spring surrounding the spring con-

nected with the tube 6 and stressed in tension. This second spring is fixed under 55 tension at one end to a thickened part of the connecting nipple 2 and at the other end to a second nipple connected, for instance, with the transverse strip 13.

In an alternative construction the spring 60 1 is mounted at the bottom of the device and the twisted strip 12 at the top, when the inner tube 6 can serve at the same time as an oil receptacle for lubrication of the strip 12.

In another alternative construction the 65 supporting tube 6, surrounds the spring 1.

What I claim is:—

1. A device for balancing a sash window or like part sliding in a window frame 70 or like guide, comprising a helical spring to one end of which is made fast a securing means for attaching the spring to one of the relatively moving parts, a tube rotatably attached at one end to said securing 75 means and fastened at the other end to the other end of the spring, said tube having at the end attached to the spring a slotted part not rotatable with respect to the tube through which part passes a twisted 80 flat strip having means at its outer end for attaching it to the other of the relatively moving parts.

2. A device according to Claim 1 in which the tube carrying the slotted part 85 passes internally through the helical spring and is connected centrally in a rotatable manner with the connecting nipple of the spring at the other end.

3. A device according to Claim 1 or 2 in 90 which the tube is secured to the nipple by a plug fixed to the end of the tube and having a stem extending through the otherwise closed end of the nipple and carrying a collar.

4. A device according to Claim 3 in 95 which the collar is substantially hemispherical and is supported in a correspondingly shaped hollow in the nipple.

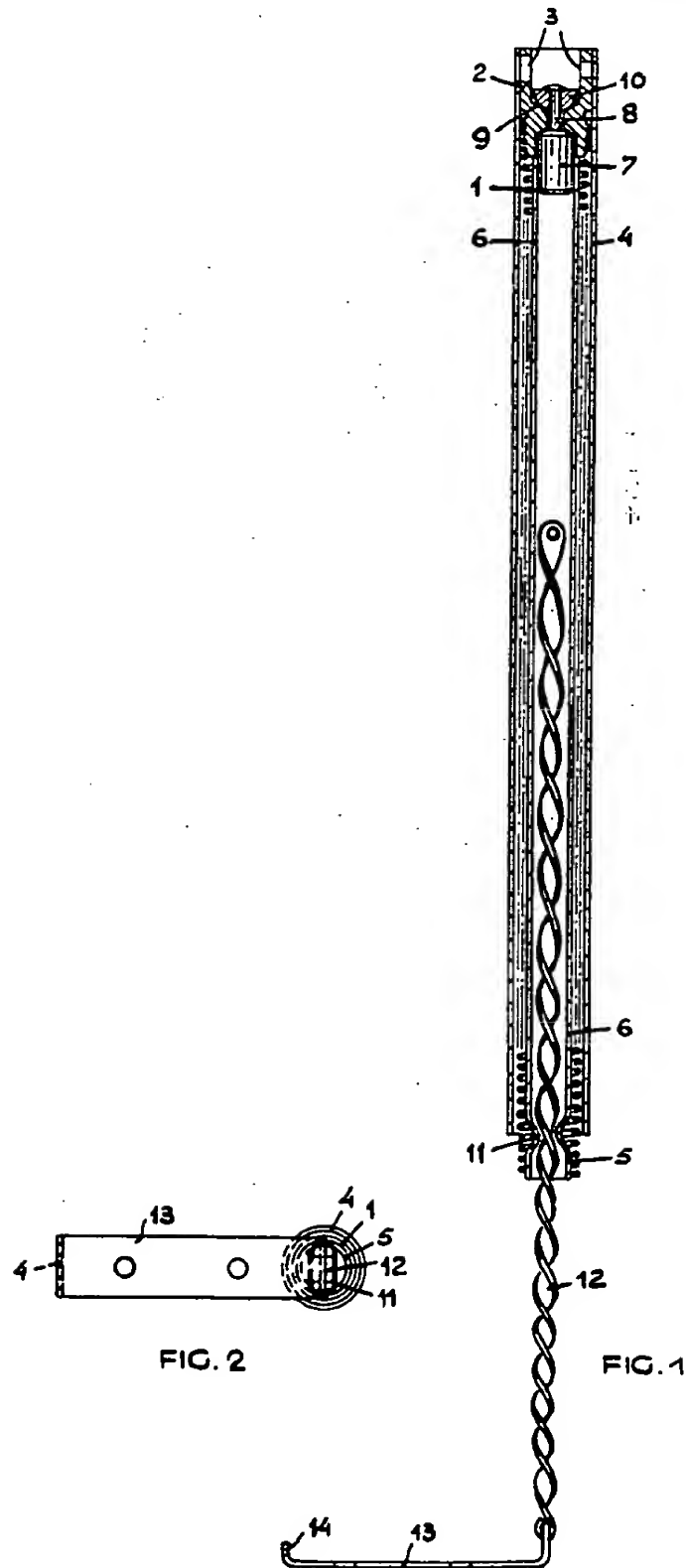
SEFTON-JONES, ODELL &  
STEPHENS,

Chartered Patent Agents,  
15, Great James Street, London,  
London, W.C.1,  
Agents for the Applicant.

# 729,287 COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of the Original on a reduced scale.



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